CLAIMS

What is claimed is:

1. An isolated polypeptide selected from the group consisting of:
   a) a polypeptide of amino acid residues 311-422 of SEQ ID NO:1; and
   b) a polypeptide that shares substantial sequence similarity with residues 311-422 of SEQ ID NO:1 and has microtubule destabilizing activity.

2. A recombinant polypeptide comprising the polypeptide of claim 1, with the proviso that the polypeptide is not CPAP.

3. An isolated polynucleotide encoding the polypeptide of claim 1.

4. An isolated polynucleotide encoding the polypeptide of claim 2.

5. A method for destabilizing microtubules in a cell, comprising providing to the cell a polypeptide in a sufficient amount to destabilize microtubules in the cell, wherein the polypeptide is selected from the group consisting of:
   a) a polypeptide of claim 1;
   b) a polypeptide of SEQ ID NO:1; and
   c) a polypeptide that shares substantial sequence similarity with SEQ ID NO:1 and has microtubule destabilizing activity.

6. The method of claim 5 wherein the polypeptide is provided to the cell as a polynucleotide that encodes the polypeptide.

7. The method of claim 6 wherein the polynucleotide is an expression vector encoding the polypeptide.

8. The method of claim 7 wherein the expression vector comprises an inducible promoter operably linked to the polynucleotide encoding the polypeptide.

9. The method of claim 7 wherein the expression vector is a viral expression vector.

10. The method of claim 7 wherein the expression vector preferentially replicates in the cell.

11. The method of claim 7 wherein the expression vector is derived from a virus selected from the group consisting of a retrovirus, an adenovirus, an adeno-associated virus, a pox virus, or a herpesvirus.

12. A method for inhibiting proliferation of a cell, comprising providing to the cell a polypeptide in a sufficient amount to inhibit proliferation of the cell, wherein the polypeptide is selected from the group consisting of:
    a) a polypeptide of claim 1;
    b) a polypeptide of SEQ ID NO:1; and
    c) a polypeptide that shares substantial sequence similarity with SEQ ID NO:1 and has microtubule destabilizing activity.

13. The method of claim 12 wherein the polypeptide is provided to the cell as a polynucleotide that encodes the polypeptide.

14. The method of claim 13 wherein the polynucleotide is an expression vector encoding the polypeptide.

15. The method of claim 14 wherein the expression vector comprises an inducible promoter operably linked to the polynucleotide encoding the polypeptide.

16. The method of claim 14 wherein the expression vector is a viral expression vector.

17. The method of claim 14 wherein the expression vector preferentially replicates in the cell.

18. The method of claim 14 wherein the expression vector is derived from a virus selected from the group consisting of a retrovirus, an adenovirus, an adeno-associated virus, a pox virus, or a herpesvirus.

19. A method for treating a tumor, comprising providing to cells of the tumor a polypeptide in a sufficient amount to inhibit proliferation of the cell, wherein the polypeptide is selected from the group consisting of:
   a) a polypeptide of claim 1;
   b) a polypeptide of SEQ ID NO:1; and
   c) a polypeptide that shares substantial sequence similarity with SEQ ID NO:1 and has microtubule destabilizing activity.

20. The method of claim 19 wherein the polypeptide is provided to the cell as a polynucleotide that encodes the polypeptide.

21. The method of claim 20 wherein the polynucleotide is an expression vector encoding the polypeptide.

22. The method of claim 21 wherein the expression vector comprises an inducible promoter operably linked to the polynucleotide encoding the polypeptide.

23. The method of claim 21 wherein the expression vector is a viral expression vector.

24. The method of claim 21 wherein the expression vector preferentially replicates in the cell.

25. The method of claim 21 wherein the expression vector is derived from a virus selected from the group consisting of a retrovirus, an adenovirus, an adeno-associated virus, a pox virus, or a herpesvirus.

26. A method for screening drugs that modulate microtubule assembly, comprising contacting microtubules with a protein that comprises the polypeptide of claim 1, in the presence and absence of a drug, and determining the effect of the drug on microtubule assembly.

27. The method of claim 26 wherein the protein is provided as a polynucleotide encoding the protein.